

of $4\frac{1}{2}$ parts of the former to 1 part of the latter), and to expose the mixture on a clean platinum wire to the point of the blowpipe flame. Fluo-boric acid is thus produced; and by its volatilization, a momentary green colour is imparted to the edge of the flame. MERLET recommends the employment of 3 or 4 parts of this flux to 1 part of the substance under examination. This test is much quoted in blowpipe books and works on chemical analysis generally; but it is altogether superfluous. With borate of soda it fails entirely, or yields very unsatisfactory results; and although it answers for most other borates and for boro-silicates, it is uselessly applied to them, because these bodies colour the flame equally well, *per se*. BERZELIUS seems strangely to have overlooked the coloration of the flame as produced by many substances under blowpipe treatment. In his work on the blowpipe, for example, he fails to notice the character in describing the reactions of lepidolite, sulphate of baryta, datolite, triphylline, and other minerals, which exhibit it most distinctly. Under axinite, moreover, he has the following statement: "Turner asserts that a flame tinged green by boracic acid is obtained by the aid of sulphate of ammonia (or bisulphate of potash) and fluor spar." This "assertion" is true enough; but *all specimens of axinite colour the flame green, per se*. The uselessness of the flux was pointed out, I find, by BUZENGEIGER as long ago as 1829. In the *Annales des Mines* for that year (tome v., p. 36), he states: "J'ai essayé, pour reconnaître la présence de l'acide borique, d'employer le flux indiqué par M. Turner, mais ces tentatives ne m'ont pas réussi, probablement par défaut d'habitude. Quoi qu'il en soit, tous les minéraux que M. Turner a vu colorer la flamme en vert en les mêlant avec son flux, m'ont donné la même réaction en les introduisant avec quelque soin dans la flamme bleue, sans les mélanger avec aucun réactif." BUZENGEIGER, whose name does not seem to be quoted in any blowpipe work, appears to have first proposed the sloping blowpipe-wick, long before it was adopted by PLATTNER; and he noticed, at the same early date, that the crimson coloration of the strontium-flame was entirely obliterated by the presence of barytic compounds.

IX.—ON THE COMPORTMENT OF CERTAIN ALLOYS UNDER THE ACTION OF THE BLOWPIPE.

In examining these reactions, about equal portions of the metals (forming the alloy) may be placed together, on charcoal, and subjected to the action of a reducing flame.